

REMARKS

Enclosed herewith is a Substitute Specification in which the specification as filed has been amended in various places to correct typographical and grammatical errors, and also to add section headings.

In support of the above, enclosed herewith is a copy of the specification as filed marked up with the above changes.

The undersigned attorney asserts that no new matter has been incorporated into the Substitute Specification.

The claims have been amended to more clearly describe the invention as disclosed in the written description. In particular, the claims have been amended for clarity.

The Examiner has rejected claims 1-3 and 5 under 35 U.S.C. 102(e) as being anticipated by U.S. Patent 6,398,505 to Sekiguchi. The Examiner has further rejected claim 4 under 35 U.S.C. 103(a) as being unpatentable over Sekiguchi. In addition, the Examiner has rejected claims 6 and 7 under 35 U.S.C. 103(a) as being unpatentable over Sekiguchi in view of U.S. Patent 5,991,153 to Heady et al.

The Sekiguchi patent discloses a cooling apparatus and cooling system for realizing efficient cooling in which a plurality of fan units, each including a fan control portion and a fan portion, are each connected via separate control lines (CS1, CS2,...,CSn) to other fan units and a central monitoring portion, and

are each connected to the central monitoring portion via separate lines conveying a fan operation information signal SP. This is in addition to at least one power line supplying V+ (and also Vcc) as well as a ground line GND.

The subject invention concerns fan protection. As described in the Substitute Specification on page 1, line 21 to page 2, line 2 (paragraph [0003], "It is an object of the invention to provide a protection circuit for a plurality of fans, wherein the number of conductive lines required to provide the actual operating status of the fans to a detection circuit does not depend on the number of fans." To that end, as claimed in claim 1, each fan unit is connected to a power supply bus, a ground bus, and a protection line bus, while a detection circuit is connected between the ground bus and the protection line bus. Each fan unit includes a fan connected between the power supply bus input and the ground bus input, and an element connected between the ground bus input and the protection line input. The element has a control input connected to the fan for receiving an operational signal. Arranged as such, each element is connected in parallel and the detection circuit can thereby determine the overall impedance (or current) of the elements by detecting the same across the protection line bus and the ground bus. Hence, no matter how many fan units are connected to the three buses, no addition connection lines are required for the detection circuit to operate correctly.

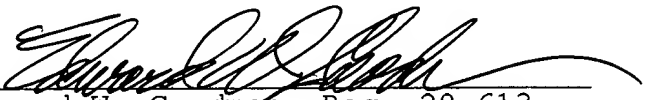
With regard to the claimed invention, Applicant submits that Sekiguchi neither shows nor suggests connecting each of the fan units to a single supply voltage bus, a single ground bus, and a single protection line bus, wherein each fan unit includes an element coupled between the protection line bus and the ground bus, and a detection circuit is separately connected between the protection line bus and the ground bus and detects the overall impedance of (or current generated by) the elements, and determines the operating conditions of the fans in the fan units based on the detection.

The Heady et al. patent discloses a heat transfer system and method for electronic displays in which an electronic display unit includes a cooling system with a plurality of fans. However, Applicant submits that Heady et al. does not supply that which is missing from Sekiguchi, i.e., a fan protection circuit having a plurality of fan units, in which each of the fan units is connected to a single supply voltage bus, a single ground bus, and a single protection line bus, wherein each fan unit includes an element coupled between the protection line bus and the ground bus, and a detection circuit is separately connected between the protection line bus and the ground bus and detects the overall impedance of (or current generated by) the elements, and determines the operating conditions of the fans in the fan units based on the detection.

In view of the above, Applicant believes that the subject invention, as claimed, is neither anticipated nor rendered obvious by the prior art, either individually or collectively, and as such, is patentable thereover.

Applicant believes that this application, containing claims 1-7, is now in condition for allowance and such action is respectfully requested.

Respectfully submitted,

by 
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On January 30, 2004

By Burnett Jones